INDEX TO VOLUME XXVIII.*

A

Absorption, atmospheric, *Langley*, 163.
by carbon dioxide, *Keeler*, 190.
Academy, National, Newport meeting, 406.
Smith medal, 77.
Affinity, chemical. *Langley*, 360, 437.
Africa, geology of South, 468.
Air, boiling point of, 150.
Alaska, glacier phenomena of, 74.
Anthemene, a hydrocarbon of chamomile, 149.
Association, American, Philadelphia meeting, 78, 303.
Physical papers before, 307.
British, Montreal meeting, 300.
Atmospheric absorption, *Langley*. 163.

B

Baines, A. C., The deflection of streams by terrestrial rotation, 434.
Baldwin, H., Orchids of N. England, 237.
Ball, J., Flora of North Patagonia, 157.
Barker, G. F., chemical abstracts, 146, 452.
British association, 300.
American Association, 303.
electrical exhibition at Philad., 386.
Barometric observations, reduction of, *Loomis*, 1, 81.
Bauermann, H., Text-book of Descriptive Mineralogy, 318.
Becker, G. F., mineral belts of the Pacific slope, 209.
Theory of faulting criticized, 348.
Becquerel, H., infra-red emission-spectra of metallic vapors, 457.
wave-lengths in the infra-red of the solar spectrum, 459.
Behr, H. H., Genera of Vascular Plants near San Francisco, 156.
Beryllium chloride, vapor-density of, 149.
crystalline form of, 148.
Bessey, C. E., The Essentials of Botany, 475.
Blake, F. H., vanadinite in Arizona, 145.
Blake, W. P., crystallized gold, 57.
columbite in the Black Hills, 340.
Blanford, W. T., fossils as a criterion of geological equivalency, 315.
Boissier's Flora Orientalis, 157.
Bohnensieg, G. C. W., Repertorium Annuum Literaturæ Botanicæ, 473.
Bostwick, A. E., influence of light on electrical resistance of metals, 133.
BOTANY—
Climate, influence of, on vegetation. *Buysman*, 354.
Flora Brasiliensis, 402.
Fungi, respiration and transpiration of, 241.
Hypopitys or Hypopithys, 238.
Lastarriæa, 76.
Lenticels, structure and function, 239.
Minnesota flora, 472.
Nectaries and water-glands, 240.
North American flora, *Gray*, 323.
Palms, structure and growth of, 239.
Patagonian flora, 157.
Plants, detection of nitrates and nitrites in, 239.
Trilisa, 403.
See further under GEOLOGY.
Brezina, A., Krystallographische Untersuchungen, 75.
Browne, A. E., Becker's theory of faulting, 348.
Bureau of Scientific Information, 320.
Buysman, influence of sea and continental climate on vegetation, 354.

C

Campbell, J. L., geology of the Blue Ridge, 221, 242.
Carbonic oxide, boiling point of, 150.
absorption by, 190.
Carhart, H. S., electromotive force of a Daniell cell, 374.
Chamberlin, T. C., terminal moraine of second glacial epoch, 228.
Chatard, T. M., mineralogical notes, 20.
Cheesman, L. M., measurement of electric currents, 117.
Chemical affinity, *Langley*, 360, 437.
Clarke, C. B., East Indian Species of Cyperus, 75.
Clarke, F. W., mineralogical notes, 20.
Cold, see *Temperature*.
Collett, J., Indiana Geological Report, 314.

*This Index contains the general heads BOTANY, GEOLOGY, MINERALS, OBITUARY, ZOOLOGY, and under each the titles of Articles referring thereto are mentioned.

Color impressions, duration of, *Nichols*, 243.
and atomic weight of compounds, 453.
Comoy, Études pratique sur les marées fluviales, 228.
Congress, International, at Washington, 405.
Cooke, J. P., Jean-Baptiste-André Dumas, 289.
Crystallization, strain connected with, 461.
Cyanides, production of, from trimethylamine, 147.

D

Dana, E. S., on herderite, 318.
Dana, J. D., terminal moraine of the second glacial epoch, 228.
terminal moraine of Penn., 231.
the southward ending of a great synclinal in the Taconic, 268.
Taconic slates, 311.
the Azoic system, 313.
Cortlandt hornblendic and augitic rock, 384.
origin of bedding in so-called metamorphic rocks, 393.
making of limonite ore-beds, 398.
the decay of quartzyte, 448.
Davis, W. M., gorges and waterfalls, 123.
distribution and origin of drumlins, 407.
Whirlwinds, Cyclones and Tornadoes, 151.
Dawson, Prehistoric man in Egypt and Syria, 158.
Deep-sea fauna, 319.
Derby, O. A., flexibility of itacolumite, 203.
gold in Brazil, 440.
Diller, J. S., fulgurite from Mt. Thielson, 252.
octahedrite as an alteration product of titanite, 234.

E

Earthquake in Middle and Eastern States, 242.
of Ischia, 312.
Eastman, I. R., new meteorite, 299.
Eclipse, see *Sun*.
Electric battery, observed and calculated force of, 452.
current, silver voltameter for measurement of, 224.
currents, measurement of rapidly alternating. *Cheesman*, 117.
of earth's surface, 71.
Electrical congress, results of, 71.
exhibition at Philadelphia, 225.
at Paris, 310.
Electricians, national conference of, 386.
Electricity, atmospheric, 70.
earth currents, 71.
resistance of metals, influence of light on, *Bostwick*, 133.
Electrometric measurements, 390.
Electromotive force of a Daniell cell, *Carhart*, 374.
Elkin, W. L., Heliometer determinations of Stellar Parallax, 404.
Explosives, modern high, 310.

F

Ford, S. W., Primordial fossils in Stuyvesant, N. Y., 35.
age of rocks near Schodack Landing, 206, 242.
Forel, F. A., Glacial Studies, 400.
Fossil, see GEOLOGY.
Fulgurites from Mt. Thielson, *Diller*, 252.

G

Galenite, synthesis of, 455.
Galton, F., Life-History Album, 78.
Gardiner, W., water-glands and nectaries, 240.
Gas analysis under greatly diminished pressure, 454.
Gases and vapors, diffusion of, 70.
Geological Congress, third session of the, 78, 318.
GEOLOGICAL REPORTS AND SURVEYS—
Indiana, 314.
Minnesota, 155, 316, 322, 472.
New York, 234.
Pennsylvania, 231, 234, 396, 406, 470.
United States, 20, 228, 401, 462.
GEOLOGY—
Africa, geology of South, 468.
Age, fossils as a criterion of, 315.
Apatite of the Canadian rocks, *Vennor*, 74.
Archæopteryx, the Berlin, 465.
Argillite of Newfoundland, *Wadsworth*, 101.
Azoic, subdivisions of, *Whitney*, 313.
Basalt of Newfoundland, *Wadsworth*, 94.
Bedding, origin of, *Dana*, 393.
Bitumens, origin of, *Peckham*, 105.
Blue Ridge, near Balcony Falls, *Campbell*, 221.
Bowlder clays of Chicago, 317.
Canadian rocks, apatite of, *Vennor*, 74.
Centre County, Penn., 396.

GEOLOGY—
Ceratosaurus, united metatarsals of, *Marsh*, 161.
Coal plants of Mazon creek, 314.
Coals, structure of Carboniferous, 467.
Corals, Carboniferous of Scotland, 316.
Cortlandt hornblendic rock, *Dana*, 384.
Cuba, iron-ores of, *Kimball*, 416.
Drift of Minnesota, 316.
Drumlins, distribution of, *Davis*, 407.
Ecca beds of South Africa, 468.
Faulting, Becker's theory of, *Browne*, 348.
Fossils as a criterion of geological equivalency, 315.
Primordial, in Stuyvesant, *Ford*, 35.
Glacial Epoch, terminal moraine of second, 228.
moraine in Pennsylvania, 231.
deposits of Long Island, 230.
period and the Niagara River, *Wright*, 32.
rivers of Maine, 152.
studies, 400.
Glaciation south of the terminal moraine, supposed, *Lewis*, 276.
Gold in Brazil, *Derby*, 440.
Granite, origin of Tuscan, *Lotti*, 155.
Insects, Triassic, *Scudder*, 199.
Iron-ores of Cuba, *Kimball*, 416.
Itacolumite, flexibility of, *Derby*, 203.
Kame rivers of Maine, *Stone*, 152.
Kaolin from quartzyte, 449.
Lake Superior, copper-bearing rocks of, 462.
Limonite ore beds, *Dana*, 398.
Long Island, moraine deposits of, 230.
Metamorphism, *Lehmann*, 392.
Mineral belts of the Pacific slope, *Becker*, 209.
Moraine, see *Glacial Epoch*, above.
Myriapods, Carboniferous, 470.
Namaqualand schists, 468.
Newfoundland, rocks of, *Wadsworth*, 94.
Niagara River and the Glacial period, *Wright*, 32.
Nickel ore in Nevada, *Newberry*, 122.
Ore beds of Centre Co., Penn., 397.
of Newfoundland, *Wadsworth*, 102.
Ores, deposition of, *Newberry*, 465.
Phosphates of North Carolina, 75.
Quartz deposit made at the ordinary temperatures, 448, 466.
Quartzyte, decay of, *Dana*, 448.
Rocks of Newfoundland, *Wadsworth*, 94.
origin of crystalline, *Hunt*, 72.
GEOLOGY—
Sand, formation of, *Dana*, 448.
miniature domes in, 469.
Sandstone, surface consolidation by atmospheric action. *Wadsworth*, 466.
Streams, deflection of, *Baines*. 434.
Taconic slates, age of, *Hall*, 311.
range, synclinal in, *Dana*, 268.
Tertiary of Eastern and Southern United States, 316.
shells, *Meyer*, 154.
Texas, Paleozoic of Central, *Walcott*, 431.
Waterfalls, gorges and, *Davis*, 123.
Gilbert on the deflection of streams by terrestrial rotation, criticized by *Baines*, 434.
Gill, D., Heliometer determinations of Stellar Parallax, 404.
Gill, T., Principles of Zoogeography, 241.
Glacier phenomena of Alaska, 74.
see also under GEOLOGY.
Gold, see MINERALS.
Goodale, G. L., botanical notices, 239, 474.
Gorges and waterfalls, *Davis*, 123.
Gould, B. A., Report upon the unification of Longitudes, 321.
Letter from, 480.
Gray, A., memorials of Engelmann and Heer, 61.
botanical notices, 75, 155, 237, 402, 472.
George Bentham, 319.
North American flora, 323.
Synoptical Flora of North America, 237.
Gulf of Mexico, dimensions of, 320.
Gumbel, K. W. von, Geologie von Bayern, 317.

H

Hall, J., Monomyaria of the Upper Helderberg, etc., noticed, 234.
the Hudson River age of the Taconic slates, 311.
Hazen, H. A., tornadoes, 181.
Heap, D. P., International Exhibition of Electricity, 310.
Helmholtz's dispersion theory, 457.
Herderite, composition of, 318, 401, 471.
Hitchcock, R., causes of variation, 49.
Hooker. J. D., Student's Flora of the British Islands, 238.
Hunt, T. S., origin of crystalline rocks, 72.

I

Ice, living organisms in, *Leidy*, 476.
Invilliers, E. V. d', Geology of Centre Co., Penn., 396.

Iron, meteoric, from Texas, *Mallet*, 285.
Irving, R. D., paramorphic origin of hornblende of the crystalline rocks of the northwest, 464.
Copper-bearing rocks of Lake Superior, 462.
Ischia, earthquake of, 312.
Itacolumite, see GEOLOGY.

J

Jackson, A. W., on colemanite, 447.
James, T. P., Mosses of North America, 155.
Johnson, H. A., microscopic organisms in bowlder clays of Chicago, 317.
Jones, T. R., Geology of South Africa, 468.
Joule, J. P., Scientific papers of, 151.

K

Keeler, J. E., absorption of radiant heat by carbon dioxide, 190.
Kimball, J. P., specular iron-ores of Santiago de Cuba, 416.
Kunz, G. F., chlorophane from Amelia County, Virginia, 235.

L

Lactosin, a new carbohydrate, 149.
Langley, J. W., chemical affinity, 360, 437.
Langley, S. P., amount of atmospheric absorption, 163, 242.
Lehmann, J., Untersuchungen über die Entstehung der altkrystallinen Schiefergesteine, 392.
Leidy, J., organisms in ice, 476.
Lesley, J. P., ore beds of Centre Co., Penn., 397.
Lesquereux, L., Mosses of North America, 155.
Coal Flora of Pennsylvania, 470.
Lewis, H. C., Pennsylvania Geological Report, 231.
supposed glaciation south of the terminal moraine, 276.
Light, method of determining the standard of, 150.
effect upon electrical resistance of metals, 133.
Lightning tubes, *Diller*, 252.
Lindenkohl, A., dimensions of the Gulf of Mexico, 320.
Linnæan Society of New York, 319.
Lloyd, J. U., Drugs and Medicines of North America, 474.
Loomis, E., contributions to meteorology, 1, 81.
Lotti, B., origin of Tuscan granite, 155.

M

Macfarlane, J., Geological Railway Guide, 471.
Mackintosh, J. B., composition of herderite, 401.
Magnetic forces, measurement of by hydrostatic pressure, 223.
polarity and neutrality, 309.
Magnetization, change in temperature from, 225.
Mallet, J. W., meteoric iron from Texas, 285.
Marsh gas, preparation of, 148.
Marsh, O. C., united metatarsal bones of Ceratosaurus, 161.
Martin, H. N., Handbook of Vertebrate Dissection, 77.
Matthew, G. J., Fauna of the St. John Group, New Brunswick, 74.
Metallic vapors, infra-red emission-spectra of, 457.
Meteorite, new, *Eastman*, 299.
Meteorites, origin of, 470.
Meteorological Society, New England, 159.
Meteorology, contributions to, *Loomis*, 1, 81.
Meyer, O., notes on Tertiary shells, 154.
Mineralogist and Antiquarian, 406.
MINERALS—
Aimafibrite, 236.
Aimatolite, 236.
Allanite, *Clarke* and *Chatard*, 21.
Alunogen, *Clarke* and *Chatard*, 24.
Annabergite, 122.
Apatite, 74.
Beryl, *Clarke* and *Chatard*, 25.
alkalies in, *Penfield*, 25.
Cassiterite, *Clarke* and *Chatard*, 25.
Chlorophane from Virginia, *Kunz*, 235.
Cimolite, *Clarke* and *Chatard*, 23.
Colemanite, *Jackson*, 447.
Columbite, *Blake*, 340.
Damourite, *Clarke* and *Chatard*, 21.
Gold, crystallized, *Blake*, 57.
in Brazil, *Derby*, 440.
Goyazite, 237.
Halloysite, *Clarke* and *Chatard*, 23.
Halotrichite, *Clarke* and *Chatard*, 24.
Herderite, 318, 401, 471.
Hornblende, paramorphic origin of, *Irving*, 464.
and pyroxene, *Williams*, 259.
Hyalite, *Clarke* and *Chatard*, 25.
Jade and pectolite, *Clarke* and *Chatard*, 20.
Kaolin from quartzyte, *Dana*, 449.
Manganostibiite, 236.
Margarite, *Clarke* and *Chatard*, 22.
Niccolite, *Newberry*, 122.

MINERALS—
Octahedrite, *Diller*, 234.
Pectolite, *Clarke* and *Chatard*, 20.
Prochlorite, *Clarke* and *Chatard*, 24.
Pyroxene and hornblende, *Williams*, 259.
Saussurite, *Clarke* and *Chatard*, 21.
Stibnite from Japan, 402.
Tantalite, *Schæffer*, 430.
Titanite, *Diller*, 234.
Tourmaline, 456.
Utahite, 236.
Vanadinite in Arizona, *Blake*, 145.
Vivianite, *Clarke* and *Chatard*, 25.
Minnesota Geological Report, Crustacea, 322.
Moale, W. A., Hand-book of Vertebrate Dissection, 77.
Moseley, H. N., Deep-sea Fauna, 319.

N

National Dispensatory, 322.
Newberry, J. S., the deposition of ores, 406, 465.
Newberry, S. B., nickel ore from Nevada, 122.
Newton, H. A., astronomical notice, 404.
Niagara River, see GEOLOGY.
Nichols, E. L., duration of color impression on the retina, 243.
a study of pigments, 342.
Nitrates, detection of, in plants, 239.

O

OBITUARY—
Bentham, G., 319.
Dumas, J. B. A., 289.
Engelmann, G., 61.
Heer, Oswald, 67.
Hochstetter, F. von, 160.
Lavallée, Alphonse, 75.
Smith, Robert Angus, 79.
Ocean, deep-sea fauna, 319.
deposits, *Verrill*, 379.
Ohm, value of the, 71.
Optics, physiological, *Nichols*, 243.
Ores, deposition of, *Newberry*, 465.
see also under GEOLOGY.
Oxygen, boiling point of, 150.

P

Parallax, stellar, 404.
Parker, T. J., A Course of Instruction in Zootomy, 76.
Parlatore, F., Flora Italiana, 403.
Parry, C. C., Chorizanthe, 76.
Peckham, S. F., origin of bitumens, 105.
Penfield, S. L., occurrence of alkalies in beryl, 25.
Perlitic structure, development of, 461.
Phillips, J. A., Treatise on Ore Deposits, 406, 469.
Phillips, W. B., North Carolina Phosphates, 75.
Photographing colored objects in their natural shades, 223.
Pickering, E. C., light of comparison stars for Vesta, 17.
Annals of Observatory of Harvard College, 319.
Pigments, a study of, *Nichols*, 342.
Planet Vesta, light of comparison stars for, *Pickering*, 17.
Plants, see BOTANY.
Polariscope, new form of, 456.
Polarization, electro-magnetic rotation of plane of, 456.

R

Rath, G. vom, Geologische Briefe aus America, 401.
Rayleigh, Presidential address, 300.
Ridley, H. L., African Cyperaceæ, 75.
Rivers, deflection of, *Baines*, 434.
Rockwood, C. G., earthquake in Middle and Eastern States, 242.
Russell, I. C., Geological History of Lake Lahontan, 401.
Rutley, F., strain connected with crystallization, 461.

S

Schæffer, C. A., a new tantalite locality, 430.
Scudder, S. H., Triassic insects, 199.
Carboniferous Cockroaches and Myriapods, 470.
Sea, see *Ocean*.
Smith, S. I., crustacea of the Albatross dredgings, 53.
zoological notices, 76.
Society, Meteorological, of New England, 159.
Royal of Canada, 159.
of New South Wales, 160.
Solar, see *Sun*.
Solvents, law of solidification of, 146.
Spectra of metallic vapors, 391, 457, 459.
Stokes, A. C., new fresh-water infusoria, 38.
change of generic name Solenotus to Notosolenus, 158.
Stone, G. H., the kame rivers of Maine, 152.
Storer, F. H., shell- and rock-boring mollusks, 58.
obituary of R. A. Smith, 79.

Strasburger, Das Botanische Practicum, 474.
Streams, deflection of, *Baines*, 434.
Sun, infra-red spectrum of, 391, 459.
eclipse observations, 477.
Swan incandescent lamp, radiation of, 225.

T

Tait, P. G., Light, noticed, 310.
Temperatures, production of low, 224.
Thomas, B. W., microscopic organisms in bowlder clays of Chicago, 317.
Thomson, J., corals of the Carboniferous of Scotland, 316.
Thomson, W., Presidential address, 302.
Lectures on Molecular Dynamics, 480.
Thurston, R. H., Materials of Engineering. 405.
Tides in rivers, 228.
Toluene, action of amyl-chlorides on, 455.
Tornadoes, *Hazen*, 181.
Tourmaline, conductivity of, for heat, 456.
Trowbridge, J., physical notices, 70, 150, 223, 390, 456.
physical papers read before the American Association, 307.

U

Underwood, L. M., Catalogue of North American Hepaticæ, 403.
Upham, W., Minnesota Geological Report, 316.
Catalogue of the Flora of Minnesota, 472.
Upton, W., Caroline Island Eclipse Expedition, 477.

V

Vapor densities, determinations of, 390.
Variation, causes of, *Hitchcock*, 49.
Vasey, G., Agricultural Grasses of the United States, 403.
Vennor, H. G., apatite of the Canadian rocks, 74.
Verrill, A. E., marine fauna of New England, 213.
marine fauna and deep-sea deposits, 378.
Vesta, comparison stars for, *Pickering*, 17.
Vom Rath, Geologische Briefe aus America, 401.

W

Wadsworth, M. E., rocks of Newfoundland, 94.
the Azoic system, 313.
atmospheric action on sandstone, 466.
Lithological Studies, 470.
Wahl, W. H., the Electrical exhibition at Philadelphia, 225.
Walcott, C. D., Paleozoic rocks of Central Texas, 431.
Waterfalls, gorges and, *Davis*, 123.
Watts, H., Manual of Chemistry, 72.
Wave-lengths in the infra-red of the solar spectrum, 391, 459.
Waves, tidal, in rivers, 228.
Weisbach, A., herderite, 318.
Wethered, E., structure of Carboniferous coals, 467.
Whitney, J. D., the Azoic system and its subdivisions, 313.
Williams, G. H., paramorphosis of pyroxene to hornblende, 259.
metamorphism, 392.
Winchell, N. H., Minnesota Geological Report, 155, 316.
Winkler, analysis of herderite, 318.
Wright, G. F., Niagara River and the glacial period, 32.
Wright, T. W., Adjustment of Observations, 405.
New Form of Primary Base Apparatus, 479.

Z

ZOOLOGY—
Crustacea of the Albatross dredgings, *Smith* 53.
Echidna, eggs of, 475.
Fauna of deep-sea, 319.
Infusoria, new, *Stokes*, 38.
Marine fauna of New England, *Verrill*, 213, 378.
Mollusks, boring, *Stcrer*, 58.
Notosolenus, *Stokes*, 158.
Ornithorhynchus, eggs of, 475.
Rotifers in ice, 477.
Solenotus, *Stokes*, 158.
Sponge spicules, siliceous, 76.
Variation, causes of, *Hitchcock*, 49.
Worms in ice, 477.
Zoogeography, *Gill*, 241.
See further under GEOLOGY.